

**STATUS OF CLAIMS**

This listing of the claims shall replace and supercede any prior claim listing.

1. (Currently amended) A micro-pump comprising:
  - a first layer having:
    - an inlet recess;
    - an inlet channel in fluid communication with the inlet recess; and
    - an outlet channel;
  - a second layer having:
    - an outlet; and
    - an inlet;
  - wherein the first layer and the second layer are disposed such that the inlet is opposite the inlet recess and at least a portion of the outlet channel is opposite the outlet recess and wherein at least one of the first layer and the second layer includes a pumping chamber in fluid communication with the inlet channel and the outlet channel; and
  - a third intermediate flexible layer having:
    - an inlet slit and an outlet slit positioned therein;
    - an actuatable portion abutting the pumping chamber;
    - a first valve portion adjacent the inlet slit,
  - wherein the first valve portion is disposed over the inlet to block fluid passage between the inlet and the inlet recess and wherein the first valve portion is moveable away from the inlet in response to a first

actuation of the actuatable portion to allow the inlet to be in fluid communication with the inlet recess through the inlet slit; and

a second valve portion adjacent the outlet slit, wherein the second valve portion is disposed between the outlet channel and the outlet so as to block fluid passage between the outlet channel and the outlet and wherein the second valve portion is moveable away from the outlet channel in response to a second actuation of the actuatable portion to allow the outlet channel to be in fluid communication with the outlet through the outlet slit;

wherein the inlet of the second layer comprises a recess surrounding a pedestal, the pedestal being in abutment with the inlet slit of the intermediate flexible layer; and

wherein a through-hole is defined in one of the first layer and the second layer to be in fluid communication with the pumping chamber.

2. (Original) A micro-pump according to Claim 1, wherein the pumping chamber is defined by two respective pumping recesses in the first layer and the second layer, and wherein the actuatable portion of the intermediate flexible layer is arranged between the pumping recesses.

3. (Cancelled)

4. (Original) A micro-pump according to Claim 1, wherein the outlet channel of the first layer comprises a recess surrounding a pedestal, the pedestal being in abutment with the outlet slit of the intermediate flexible layer.

5. (Original) A micro-pump according to Claim 1 wherein the inlet slit and the outlet slit are respective through-holes in the intermediate flexible layer.

6. (Original) A micro-pump according to Claim 1, wherein the intermediate flexible layer comprises a polymeric material.

7. (Original) A micro-pump according to claim 6, wherein the polymeric material is selected from the group consisting of polycarbonate, polyacrylic, polyoxymethylen, polyamide, polybutylenterephthalat and polyphenylenether.

8. (Original) A micro-pump according to claim 6, wherein the intermediate flexible layer is a membrane.

9. (Currently amended) A micro-pump according to Claim 8, wherein the membrane comprises a material selected from the group consisting of polydimethylsiloxane, MYLAR<sup>®</sup>~~mylar~~, polyurethane fluoride, and flourosilicone.

10. (Original) A micro-pump according to Claim 1, wherein the intermediate flexible layer is a unitary layer.

10013.0001US  
Serial No. 10/676,601

11. (Original) A micro-pump according to Claim 1, wherein the intermediate flexible layer is at least substantially flat.

12. (Cancelled)

13. (Original) A micro-pump according to Claim 1, wherein the first layer and the second layer are molded.

14. (Original) A micro-pump according to Claim 1, further comprising an actuator disposed in the pumping chamber for actuating the actuatable portion of the intermediate flexible layer.

15. (Original) A micro-pump according to Claim 14, wherein the actuator is a bimorph PZT cantilever.

16. (New) A micro-pump comprising:  
    a first layer having:  
        an inlet recess;  
        an inlet channel in fluid communication with the  
    inlet recess; and  
        an outlet channel;  
    a second layer having:  
        an outlet; and  
        an inlet;  
    wherein the first layer and the second layer are  
    disposed such that the inlet is opposite the inlet recess  
    and at least a portion of the outlet channel is opposite  
    the outlet recess and wherein at least one of the first

layer and the second layer includes a pumping chamber in fluid communication with the inlet channel and the outlet channel; and

a third intermediate flexible layer having:

an inlet slit and an outlet slit positioned therein;

an actuatable portion abutting the pumping chamber;

a first valve portion adjacent the inlet slit,

wherein the first valve portion is disposed over the inlet to block fluid passage between the inlet and the inlet recess and wherein the first valve portion is moveable away from the inlet in response to a first actuation of the actuatable portion to allow the inlet to be in fluid communication with the inlet recess through the inlet slit; and

a second valve portion adjacent the outlet slit,

wherein the second valve portion is disposed between the outlet channel and the outlet so as to block fluid passage between the outlet channel and the outlet and wherein the second valve portion is moveable away from the outlet channel in response to a second actuation of the actuatable portion to allow the outlet channel to be in fluid communication with the outlet through the outlet slit;

wherein the outlet channel of the first layer comprises a recess surrounding a pedestal, the pedestal being in abutment with the outlet slit of the intermediate flexible layer; and

10013.0001US

Serial No. 10/676,601

wherein a through-hole is defined in one of the  
first layer and the second layer to be in fluid  
communication with the pumping chamber.